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THE COTTON GINNERS' ROLE IN THE WAR PROGRAM

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Cotton ginners of this country, as the initial processors of a crop that is of extreme importance in the food and fiber program of the United States Department of Agriculture, are in a position to make valuable contributions to the Nation's war program. For sometime now many ginners have been asking the question, "What can I do in my community with my gin plant to help win this war beside the things that the Government has already called upon me to do?" It is obvious that one of the foremost jobs that the ginners can perform is to become more thoroughly informed on ways and means for improving the quality of cotton and to concentrate more than ever before on furthering cotton improvement programs, in every way possible, in order to achieve the goal of abundant production of high quality cotton.

Of course, the first job to put over is that of encouraging producers to plant good seed of adapted varieties of cotton that have been proved to be superior in quality and satisfactory in yield. The ginners of Alabama and other cotton-producing States have for a long time played an important part in the organized efforts designed to improve the quality and spinning value of American cotton. They will, no doubt, continue to do so on an even larger scale in order to meet the requirements of cotton spinners in the manufacture of many war materials, as well as of a wide variety of civilian goods.

Fabrics needed in uniforms and other items have resulted in a tremendous drain on the surplus of American upland cotton 1-1/8 inches and longer in staple. To prevent a critical shortage, a program is now under way urging farmers to produce more long staple cotton than ever before. To encourage such production, the Government will pay additional loan premiums on staples of 1-1/8 inches and longer. The increases in premiums announced by the Commodity Credit Corporation should enable producers to realize the same per acre return from the longer cottons which have low yields as from the shorter cottons which generally have higher yields.

In order to provide for mill requirements for 1942-43 and a moderate carry-over at the end of the season, about 1,400,000 bales of cotton 1-1/8 to 1-1/4 inches in staple should be produced this year. This is an increase of about 700,000 bales, or almost double the production of such lengths in 1941. Production of the long staple American upland cotton of 1-1/8 inches and longer is limited primarily to certain areas in Mississippi, Arkansas, Louisiana, Missouri, Tennessee, South Carolina, North Carolina, Florida, and the irrigated areas of Texas, Arizona, New Mexico, and California.

While in Alabama the Department has not requested a shift in production from short staple to long staple cotton of staple length of 1-1/8 inches and longer, your State and other States are being depended upon to increase production of medium staple, 1 to 1-1/16-inch cottons, to replace the medium staple cottons that would normally have been produced in the areas that shift to long staple cotton. Growers have been urged to make the shifts within their present acreage allotments. It will be incumbent upon them to exercise especial care in picking and to try to do a good job of ginning in order to secure the highest possible grades, which are currently needed. The ginner then can make his real contribution by impressing on the producer the importance of care in harvesting and handling cotton on the farm, especially since the condition in which cotton is brought to the gin is one of the most important factors that determine the grade of the lint and the quality of the ginned seed. Some well known precautions in these operations will be needed and certain important points in connection with growing and ginning procedure should be remembered: These are:

(1) Excess foreign matter and moisture in the seed cotton reduce the value of the ginned products, and under many conditions retard ginning operations and produce excessive wear and tear on gin machinery.

(2) Undue exposure in the field results in discolored, dull, and trashy cotton, generally one full grade off for each month's exposure. To avoid losses and to simplify ginning problems, cotton should be picked frequently but not in an extremely wet condition.

(3) To gin cotton in a green, damp, or wet condition, causes rough preparation and lowers the quality as much as 1 or 2 grades. This lowered quality may reduce the market value of long staple cotton as much as $10 or more per bale. When dews are heavy, seed cotton will generally be too damp for good ginning if picked before 9 or 10 o'clock in the morning, and drying these pickings during the day, if only enough to remove the excess moisture, improves the ginning. If cotton is picked while damp, it can be dried artificially at the gin, or it can be dried naturally through proper handling and storing, provided it is not so wet that the seed are soft.

(4) Gin machinery possesses definite limitations with respect to its effectiveness in handling carelessly harvested cotton. Present-day drying, cleaning, and extracting machinery--effective as it is--cannot put roughly harvested, trashy, or wet cotton in such condition that it will gin out a sample equal in quality to fiber ginned from clean cotton that has been picked by hand under relatively dry conditions.

These points bring us to the things that the ginner can do in connection with the actual operation of his plant to preserve or improve the quality of the lint and seed. In connection with these efforts, it is well that ginners should continue to be guided by certain important facts. These are:

(1) Artificially drying of green and damp cotton will greatly improve the grade of the lint and the storage properties of the seed. The drying process also aids in cleaning trashy cotton and ultimately providing cleaner lint and seed.

(2) Extracting processes such as those incorporated in feeders of the type now widely used in the Cotton Belt are essential to the improvement of the grade of trashy or weather damaged cotton.

(3) Loose seed roll operation is basic to smooth ginning. Ginning the seed so close with dense seed rolls as to cause particles of seed coat fragments to get into the lint will so lower the grade and value of the lint as to more than offset the extra weight of lint put into the bale. If gin saws are in good condition, are of full diameter, and are operated at 600 to 700 revolutions per minute, and if an effective doffing system is used, the seed can be well cleaned even with very loose seed rolls and smoothly ginned lint can be produced.

(4) A classification or examination of the samples at regular intervals will reveal the quality of the ginning, and provide an indication of the underlying faults--whether they are due to farm practices or to ginning methods. Producers and ginners will find it profitable to take time to examine their samples, for much loss can be avoided by tracing gin damage to its source and promptly making the corrections needed.

In addition to being encouraged by the U. S. Department of Agriculture to exercise necessary precautions for turning out smoothly and cleanly ginned lint, cotton ginners are being requested by the War Production Board to make every effort to keep trash out of the seed so that higher grade linters can be made available for the manufacture of smokeless powder. Leaves and sticks, and dirt and sand in cotton linters that are used in the manufacture of munitions, aside from being an economic loss, entail serious difficulty in the purification of linters, and naturally impair the value of munitions manufactured from linters that contain them. Therefore, care in cotton harvesting and handling is as important in providing clean seed as in producing bright and clean lint. To accomplish both ends, it is obvious that cotton should be picked as clean and as dry as possible, or that it should be thoroughly cleaned and dried before ginning if the job of picking was not well performed in the field.

A further benefit to the quality of seed associated with these precautionary measures relates to improved milling quality of the seed. Free fatty acids which adversely affect the quality of the oil worked out of the seed can be held down or greatly reduced by picking cotton dry and picking it before it is unduly exposed to weather damage in the field, as well as by drying damp or wet cotton before it is ginned.

Ginners can make other contributions than those already mentioned. Many have already demonstrated their ingenuity in adequately equipping their gins, in the face of scarcity of important material, in an effort to aid growers in achieving their goal of high quality cotton production. Ginners have been called on to conserve material needed in the war program. They can do much to prolong the life of their machinery by taking better care of it. This involves timely repairs, periodic cleaning of equipment, and continued attention to lubrication of bearings and moving parts.

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There is much evidence to the effect that the ginners' efforts along the lines of modernization and care of their plants were greatly accelerated last year. More progress in the improvement of ginning plants and operating practices was made in 1941 than during any other year on which the U. S. Cotton Ginning Laboratory has records. A study in 1941 of almost 600 gins, including representative gins from North Carolina to Arizona, indicated that 15 percent installed new saws, and 12 percent reworked and put their saws in first-class condition. In 16 percent of the gin plants, saws were speeded up to provide smoother and more efficient ginning. The condition of many of the gins was improved by installing new or by reconditioning old ribs and brushes.

In 1941, cotton drying facilities were provided in at least 450 additional ginning establishments already in operation as well as in more than 100 of the new plants, thus bringing the total number of drier-equipped gins up to 1,913. The study of gin machinery and operating practices brought out the fact that new extractor feeders replaced inefficient plain cylinder feeders or obsolete extractor feeders in 5 percent of the gins. Ginners are also adopting better operating practices as evidenced by the fact that the proportion of gins running with loose seed rolls in 1941 was greater by 10 percent than in 1940.

About 200 new gin installations were made in 1941. These included completely new plants as well as plants in which gin stands, feeders, and distributor and all obsolete auxiliary equipment except the press, condenser, or power unit were replaced. All the installations contained modern extractor-cleaner feeders and 54 percent had cotton-drying facilities to improve the grade of damp and trashy cotton. The average gin saw speed was 670 revolutions per minute or high enough to provide the loose roll ginning which was in evidence in almost 90 percent of the so-called new gin plants.

It is fortunate for the cotton industry that widespread improvements have been made in gin machinery in recent years. These improvements, which have been aided and encouraged by ginning research developments and by educational and extension activities, will be reflected in better ginning in years to come.

So, in conclusion, we may say that cotton ginners have already recognized to a considerable extent their heavy responsibilities in this emergency, and have taken steps to assume them. They need to realize more fully that it is more important than ever before to see that a good job of ginning is performed. In short, it is evident that with the ginners doing their utmost in this crisis in providing good service with the equipment at hand and conserving materials and resources now needed in our war efforts, and with the producers making special effort to bring cotton to the gin in prime condition for ginning, the goal of abundant production of high quality cotton is within reach.

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Rosin

Its possible use in the present emergency as a partial replacement for coconut oil. (Published in "Soap" Feb.1942.)

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As the demands of national defense and reduced import facilities make usual supplies difficult to obtain, it may become necessary for soap makers to consider modification of present processes and products, making use of more readily available materials. In this connection a brief review of the properties and some data on sodium rosinate may be of interest.

Rosin has been used in soap making since the middle of the nineteenth century. It blends successfully with fats and oils to give quality soap products. In the past some have used excessive amounts of rosin in soap. Excessive use, is, of course, most common when rosin is much cheaper than fats and the hope of greater immediate profit seems more desirable than the good will of the customer. The improper blending of rosin and fats in soap making is probably responsible for much of the prejudice against soaps containing sodium rosinate.

The principal fatty acids present in soap are caprylic, capric, lauric, myristic, palmitic, stearic, oleic, linoleic, and linolenic, the amounts present in a given soap depending upon the fats and oils used. Examination of the properties of the soaps of individual fatty acids shows that not all are similar. Some of these soaps have many desirable properties while others are not satisfactory when used alone. Comparison of sodium rosinate with the soaps of individual fatty acids indicates that sodium rosinate resembles sodium laurate more than the soaps of the other fatty acids mentioned above. In view of the similarity of sodium laurate and sodium rosinate it appears that rosin might be used to replace part of the coconut oil used in soap products.

Rosin soap (sodium rosinate) should be looked on as a material that has to be blended with other soaps, just as the soaps of different fats and oils are blended. Proper blending of rosin soap with fatty acid soaps will yield quality products while other blends, even with the same amount of rosin, may be unsatisfactory. In general, the addition of sodium rosinate to a fatty acid soap increases the solubility of the soap, softens the soap to some extent and increases the lathering properties of difficult soluble soaps.

Today rosin is used chiefly in yellow bar soaps. Several factors responsible for this limited use are: the trend towards white soap products; the fact that rosin contributes some color to soap; disinclination to change the present product as present procedure and supplies are entirely satisfactory; and the belief that only dark colored products can be made with rosin.

Very light yellow soap flakes as well as light yellow bar soap can be made that contain as much as 20 per cent rosin. If the rosin is properly stabilized either catalytically (2) or by hydrogenation (1) it contributes little or no color to soap products. White soap products can be made with stabilized rosins. The use of these rosins will depend upon their prices in relation to those of the fats and oils used in soap.

In normal times plant operation and control are given more attention than modification of the product. As fats and oils increase in price and become more difficult to obtain, more attention will be given to the use of more readily available materials. Serious consideration, we believe, will show that rosin can be used profitably in many soap products. The amount and extent to which it can be used will be determined by the products and materials available.

Many who have used rosin in the manufacture of soap are familiar with its properties and know how it can be used to best advantage in soap products. However, the literature on rosin soap and its relation to fatty acid soaps used in the detergent field is limited. To extend the literature on rosin soap, the Naval Stores Research Division undertook a study of rosin soap. These studies dealt with the color that rosin contributes to soap (7), surface tension (4), titre (3), detergent action (8), foaming properties (5), solubility of calcium soaps of gum rosin, rosin acids and fatty acids (6) and germicidal activity of rosin and fatty acid soaps (9, 10).

It would be unwise for me to try to give exact ways in which rosin should be used in a specific soap product as the amount used and manner of use will depend upon the equipment and materials available. All I wish to do is to call attention to the possibility of using rosin in soap products where it is not generally used today and to recent articles on rosin soap which may be useful to those considering the use of rosin in present products.

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